

SUPERFUND CHEMICAL DATA MATRIX METHODOLOGY

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TABLE OF CONTENTS

List of Figures	iv
List of Tables	iv
1.0 INTRODUCTION	1
2.0 DATA SELECTION METHODOLOGY	2
2.1 Hazardous Substance Identities and SCDM Protocols	2
2.1.1 Generic Values	2
2.1.2 Compound Classes with Values for Individual Substances	3
2.1.3 Substances with Unique Value Selection Protocol	5
2.2 Toxicity Information	5
2.2.1 Non-Carcinogenic Toxicity Values	6
2.2.1.1 Reference Dose (RfD) - Oral; Reference Concentration (RfC) - Inhalation	6
2.2.1.2 LD ₅₀ - Oral, Dermal; LC ₅₀ - Inhalation	7
2.2.2 Carcinogenic Toxicity	8
2.2.2.1 Cancer Slope Factor (SF) and Weight-of-Evidence - Oral; Unit Risk Factor (URF) and Weight-of-Evidence - Inhalation	8
2.2.2.2 ED ₁₀ and Weight-of-Evidence - Oral, Inhalation	11
2.3 Mobility Information	11
2.3.1 Vapor Pressure	12
2.3.2 Henry's Law Constant	13
2.3.3 Water Solubility	14
2.3.3.1 Water Solubility - Nonmetallic Compounds	14
2.3.3.2 Water Solubility - Metals and Metalloids	15
2.3.4 Soil/Water Distribution Coefficient (K _d); Soil Organic/Carbon Partition Coefficients (K _{oc})	15
2.4 Persistence Information	16
2.4.1 Hydrolysis, Biodegradation, and Photolysis Half-Lives	17
2.4.2 Radioactive Half-Life	17
2.5 Bioaccumulation Potential Information	18
2.5.1 Bioconcentration	18
2.5.2 Octanol/Water Partition Coefficient Log K _{ow}	19
2.5.3 Water Solubility	20
2.6 Ecotoxicity Parameters	20
2.6.1 Acute and Chronic Freshwater and Saltwater Criteria - CCC, CMC	21
2.6.2 LC ₅₀ - Freshwater, Saltwater	21
2.7 Regulatory Benchmarks	21
2.7.1 National Ambient Air Quality Standards	21
2.7.2 National Emissions Standards for Hazardous Air Pollutants	22
2.7.3 Maximum Contaminant Levels and Maximum Contaminant Level Goals	22
2.7.4 FDA Action Level	22
2.7.5 Uranium Mill Tailings Radiation Control Act Standards	23

2.8	2.7.6 Ecological Based Benchmarks	23
	Other Chemical Data	23
	2.8.1 Physical Properties	23
	2.8.2 Logical Fields	24
	2.8.3 Substitution Classes	24
3.0	CALCULATIONS IN SCDM	26
3.1	Volatile Half-Life	26
	3.1.1 Volatilization Half-Life for Rivers, Oceans, Coastal Tidal Waters, and the Great Lakes	29
	3.1.2 Volatilization Half-Life for Lakes	30
3.2	Soil Water Distribution Coefficient (K_d); Soil Organic/Carbon Partition Coefficients (K_{oc})	31
3.3	Screening Concentration Benchmarks	33
	3.3.1 Screening Concentrations for Drinking Water Pathways	33
	3.3.2 Screening Concentrations for the Surface Water Food Chain Pathway	36
	3.3.3 Screening Concentrations for Soil Ingestion	38
	3.3.4 Screening Concentration for the Air Pathway	40
4.0	CHEMICAL DATA, FACTOR VALUES, AND BENCHMARKS	43
5.0	REFERENCES	51
APPENDICES		
A	Chemical Data, Factor Values, and Benchmarks for Chemical Substances	A-1
B-I	Hazardous Substances Factor Values	B-I-1
B-II	Hazardous Substances Benchmarks	B-II-1
C	Synonym List	C-1

List of Figures

1.	Page Heading	43
2.	Toxicity Section	43
3.	Persistence Section	44
4.	Physical Characteristics Section	45
5.	Mobility Section	46
6.	Bioaccumulation Section	46
7.	Other Data	47
8.	Class Information Section	47
9.	Assigned Factor Values Section	48
10.	Benchmarks Section	49

List of Tables

1.	Examples of Human Food Chain Aquatic Organisms	19
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1.0 INTRODUCTION

The Superfund Chemical Data Matrix (SCDM) is a database containing factor values and benchmark values used for applying the Hazard Ranking System (HRS; 40 CFR Part 300 Appendix A, 55 FR 51583) to evaluate potential National Priorities List (NPL) sites. The HRS assigns factor values for toxicity, gas migration potential, gas and ground water mobility, surface water persistence, and bioaccumulation potential. These assignments are based on the physical, chemical, ecological, toxicological, and radiological properties of hazardous substances present at a site. Hazardous substances, as defined for HRS purposes, includes both hazardous substances referenced in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) section 101(14), which are substances specifically listed under other federal laws and are known as “CERCLA hazardous substances,” and “pollutants or contaminants” as defined in CERCLA itself in section 101(33).

SCDM contains HRS factor values and benchmarks for those hazardous substances frequently found at sites that are evaluated using the HRS. SCDM also contains the physical, chemical, toxicological, and radiological input data used to calculate the factors and benchmarks. The input data presented in SCDM are taken directly from peer reviewed, generally accepted literature sources and databases and/or EPA developed literature sources and databases; or are calculated using procedures set forth by EPA and in the HRS. Further HRS procedures are then applied to the input data to determine a factor value or benchmark. The HRS also assigns extra weight to targets with exposure levels to hazardous substances that are at or above benchmarks. These benchmarks include both risk-based screening concentrations and concentrations specified in regulatory limits for the hazardous substances present at a site for a particular migration pathway.

Chapter 2.0, *Data Selection Methodology*, of this document explains how data are selected and prioritized into a hierarchy for assigning SCDM values. Chapter 3.0, *Calculations in SCDM*, describes how some types of data (i.e., volatilization half-lives, distribution coefficients, and screening concentrations) are internally calculated using data in SCDM and methodologies from published literature or regulatory guidance documents. Chapter 4.0, *Chemical Data, Factor Values, and Benchmarks*, describes how SCDM data, HRS factor values, and benchmark values are presented. The factor values and benchmark values are listed, substance by substance, in Appendix A. Appendix B contains the HRS factor values and benchmark tables (organized by pathway) for both nonradiological hazardous substances and radionuclides. Please note that *National Recommended Water Quality Criteria (NRWQC)* Chronic Criteria Continuous Concentration (CCC) and Acute Criteria Maximum Concentration (CMC) values have endnotes associated with them listed at the end of Appendix B. Appendix C contains a cross-reference index of substance name synonyms.

HAZARD RANKING SYSTEM

31 Mar 2012

Hazardous Substance Factor Values

Substance Name	CAS Number	Toxicity	Ground Water Mobility				Bioaccumulation				Ecotoxicity				Air Migration	Gas Mobility	Air Gas Part			
			Liquid		Non-Liquid		Persistence		Food Chain		Environment		Ecotoxicity							
			Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt						
Acenaphthene†	000083-32-9	10	1.00E+00	1.00E-02	2.00E-01	2.00E-03	0.4000	0.4000	500.0	500.0	500.0	500.0	10000	1000	11	0.2000	Yes	Yes		
Acenaphthylene	000208-96-8	0	1.00E+00	1.00E-04*	2.00E-01	2.00E-05*	0.4000	1.0000	500.0	500.0	500.0	500.0	0	0	11	0.0200	Yes	Yes		
Acetone†	000067-64-1	1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	0.0700	0.5	0.5	0.5	0.5	100	1	17	1.0000	Yes	No		
Acrolein†	000107-02-8	10000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.0700	0.0700	500.0	500.0	500.0	500.0	1000	1000	17	1.0000	Yes	No		
Acrylamide	000079-06-1	10000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.0000	1.0000	5.0	5.0	5.0	5.0	10	10	6	0.2000	Yes	Yes	
Alachlor**	015972-60-8	100	1.00E+00	1.00E-02	1.00E+00	1.00E-02	0.4000	0.0700	500.0	500.0	50.0	50.0	1000	1000	6	0.0200	Yes	Yes		
Aldrin	000309-00-2	10000	1.00E+00	1.00E-04	2.00E-03	2.00E-07	1.0000	1.0000	5000.0*	50000.0	50000.0	50000.0	10000	10000	6	0.0020	Yes	Yes		
Aluminum	007429-90-5	0	1.00E+00	1.00E+00*	1.00E+00*	1.00E+00*	1.0000	1.0000	50.0	50.0	5000.0*	5000.0*	100	100	...	...	No	Yes
Americium**	007440-35-9	0	1.00E+00	1.00E+00	...	...	1.0000	1.0000	5000.0	5000.0	5000.0	5000.0	0	0	...	...	No	Yes
Aniline	000062-53-3	10000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.0000	0.4000	50.0*	50.0*	500.0	500.0	10000	10	11	1.0000	Yes	No		
Anthracene†	000120-12-7	10	1.00E+00	1.00E-04	2.00E-03	2.00E-07	0.4000	0.4000	50000.0	50000.0	50000.0	50000.0	10000	10000	6	0.0020	Yes	Yes		
Antimony	007440-36-0	10000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	5.0*	5.0*	5.0	50.0*	100	100	...	...	No	Yes
Arsenic	007440-38-2	10000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	5.0	500.0	5000.0*	500.0	10	100	...	...	No	Yes
Asbestos	001332-21-4	10000	1.00E+00	1.00E-04	...	...	1.0000	1.0000	0.5	0.5	0.5	0.5	0	0	...	...	No	Yes
Barium	007440-39-3	10000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	500.0*	500.0*	500.0*	500.0*	1	1	...	...	No	Yes

* Indicates difference between previous version of chemical data (JUN 96) and current version of chemical data (JAN04).

** Indicates new hazardous substance in current version of chemical data (JAN04).

† See March 2012 SCDM update for volatile substances.

HAZARD RANKING SYSTEM

31 Mar 2012

SCDM Data Version :1/27/2004

Hazardous Substance Factor Values

Substance Name	CAS Number	Toxicity	Ground Water Mobility				Persistence	Bioaccumulation				Ecotoxicity		Air Gas Migration	Air Gas Mobility	Gas Part		
			Liquid		Non-Liquid			Food Chain		Environment		Ecotoxicity						
			Karst	Non-Karst	Karst	Non-Karst		River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt			
Benz(a)anthracene	000056-55-3	1000	1.00E+00	1.00E-04*	2.00E-05	2.00E-09*	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	10000	10000	6	0.0020	Yes Yes	
Benzene†	000071-43-2	1000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	0.4000	0.4000	5000.0	5000.0	5000.0	5000.0	1000	1000	17	1.0000	Yes No	
Benzidine	000092-87-5	10000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.0000	0.4000	50.0	50.0	50000.0*	50000.0*	100*	100*	0	0.0002	Yes Yes	
Benzo(a)pyrene	000050-32-8	10000	1.00E+00	1.00E-04	2.00E-05	2.00E-09	1.0000	1.0000	50000.0	50000.0*	50000.0	50000.0*	10000	1000	6	0.0002	Yes Yes	
Benzo(g,h,i)perylene	000191-24-2	0	1.00E+00	1.00E-04	2.00E-05	2.00E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	0	0	...	...	No Yes
Benzo(j,k)fluorene (Fluoranthene)	000206-44-0	100	1.00E+00	1.00E-04*	2.00E-03	2.00E-07*	1.0000	1.0000	500.0*	5000.0	5000.0*	5000.0	10000	10000*	6	0.0020	Yes Yes	
Benzo(k)fluoranthene	000207-08-9	100	1.00E+00	1.00E-04	2.00E-05	2.00E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	0	0	6	0.0002	Yes Yes	
Beryllium	007440-41-7	10000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	50.0	50.0	50.0	50.0	0	0	...	...	No Yes
Bis (2-ethylhexyl) phthalate	000117-81-7	100	1.00E+00	1.00E-04	2.00E-03	2.00E-07	1.0000	1.0000	50000.0	500.0*	50000.0	5000.0*	1000	1000*	6	0.0002*	Yes Yes	
Boron	007440-42-8	100	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	0	0	...	...	No Yes
Bromodichloromethane†	000075-27-4	100	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	50.0	50.0	50.0	50.0	0	0	17	1.0000	Yes No	
Butylbenzyl phthalate	000085-68-7	10	1.00E+00	1.00E-04*	2.00E-01	2.00E-05*	1.0000	1.0000	500.0	500.0	500.0	500.0	1000*	1000*	6	0.0020	Yes Yes	
Cadmium	007440-43-9	10000	1.00E+00	1.00E-02	1.00E+00*	1.00E-02*	1.0000	1.0000	5000.0	50000.0*	50000.0*	50000.0*	10000*	1000	...	...	No Yes
Carbazole	000086-74-8	10	1.00E+00	1.00E-02*	2.00E-01	2.00E-03*	0.4000	0.0700	500.0	500.0	500.0	500.0	1000*	1000*	6*	0.0200*	Yes Yes	

* Indicates difference between previous version of chemical data (JUN 96) and current version of chemical data (JAN04).

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HAZARD RANKING SYSTEM

31 Mar 2012

Hazardous Substance Factor Values

Substance Name	CAS Number	Toxicity	Ground Water Mobility				Bioaccumulation				Ecotoxicity				Air Gas Migration	Air Gas Mobility	Gas Part			
			Liquid		Non-Liquid		Persistence		Food Chain		Environment		Ecotoxicity							
			Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt						
Carbon disulfide†	000075-15-0	10	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	0.4000	5.0	5.0	5.0	5.0	100	10	17	1.0000	Yes	No		
Carbon tetrachloride†	000056-23-5	1000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	50.0	50.0	500.0	500.0	100	10	17	1.0000	Yes	No		
Cesium	007440-46-2	0	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	5.0*	50.0*	5.0*	50.0*	0	0	...	...	No	Yes
Chlordane	000057-74-9	10000	1.00E+00	1.00E-02	2.00E-03	2.00E-05	1.0000	1.0000	5000.0*	5000.0*	50000.0	50000.0	5000.0*	10000	10000	6	0.0020	Yes	Yes	
Chlordane, alpha-	005103-71-9	10000*	1.00E+00	1.00E-02	2.00E-03	2.00E-05	1.0000	1.0000	50000.0*	50000.0*	50000.0*	50000.0*	50000.0*	10000	10000	11*	0.0200*	Yes*	Yes	
Chlordane, gama-	005566-34-7	10000*	1.00E+00	1.00E-02	2.00E-03	2.00E-05	1.0000	1.0000	50000.0	50000.0	50000.0*	50000.0*	0*	0*	6*	0.0020*	Yes*	Yes		
Chlorobenzene†	000108-90-7	100	1.00E+00	1.00E-02	1.00E+00	1.00E-02	0.0007	0.0700	50.0	50.0	5000.0	5000.0	10000	100	17	1.0000	Yes	No		
Chloroform†	000067-66-3	100	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	5.0	5.0	500.0	500.0	1000	10	17	1.0000	Yes	No		
Chromium	007440-47-3	10000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	500.0*	500.0	500.0*	500.0	10000*	100	...	...	No	Yes
Chromium(III)	016065-83-1	1	1.00E+00	1.00E-04	1.00E+00	1.00E-04	1.0000	1.0000	500.0	500.0	500.0	500.0	100*	100*	...	...	No	Yes
Chromium(VI)	018540-29-9	10000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	5.0	500.0	5.0	500.0	100	100	...	...	No	Yes
Chrysene	000218-01-9	10	1.00E+00	1.00E-04*	2.00E-05	2.00E-09*	1.0000	1.0000	5.0*	5.0*	5000.0	500.0	1000	1000	6	0.0002	Yes	Yes		
Cobalt	007440-48-4	10*	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	5000.0*	5000.0*	5000.0	5000.0	0	0	...	...	No	Yes
Copper	007440-50-8	0	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	500.0*	50000.0	50000.0*	50000.0	1000*	1000*	...	...	No	Yes
Cumene†	000098-82-8	10	1.00E+00	1.00E-02	2.00E-01	2.00E-03	0.4000	0.4000	500.0	500.0	500.0	500.0	100	10	17	1.0000	Yes	No		

* Indicates difference between previous version of chemical data (JUN 96) and current version of chemical data (JAN04).

** Indicates new hazardous substance in current version of chemical data (JAN04).

† See March 2012 SCDM update for volatile substances.

HAZARD RANKING SYSTEM

31 Mar 2012

Hazardous Substance Factor Values

Substance Name	CAS Number	Toxicity	Ground Water Mobility				Persistence	Bioaccumulation				Ecotoxicity			Air Gas Migration	Air Gas Mobility	Gas Part				
			Liquid		Non-Liquid			Food Chain		Environment		Fresh		Salt							
			Karst	Non-Karst	Karst	Non-Karst		River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt						
Cyanamide**	000420-04-2	10	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.0000	1.0000	0.5	0.5	0.5	0.5	10	100	6	0.2000	Yes	Yes			
Cyanide	000057-12-5	100	1.00E+00	1.00E+00	1.00E+00*	1.00E+00*	1.0000*	1.0000*	0.5	0.5	0.5	0.5	1000	1000	17*	1.0000*	Yes*	No*			
DDD	000072-54-8	100	1.00E+00	1.00E-04	2.00E-03	2.00E-07	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	50.0*	10000	10000	6	0.0020	Yes	Yes		
DDE	000072-55-9	100	1.00E+00	1.00E-04	2.00E-03	2.00E-07	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	50000.0	10000	10000	6	0.0020	Yes	Yes		
DDT	000050-29-3	1000	1.00E+00	1.00E-04	2.00E-03	2.00E-07	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	50000.0	10000	10000	6	0.0020	Yes	Yes		
Di-n-butyl phthalate	000084-74-2	10	1.00E+00	1.00E-04*	2.00E-01	2.00E-05*	1.0000	1.0000	5000.0	5000.0	5000.0	5000.0	5000.0	1000	10000	6	0.0200	Yes	Yes		
Di-n-octyl phthalate	000117-84-0	100	1.00E+00	1.00E-04	2.00E-03	2.00E-07	1.0000	1.0000	500.0	500.0	50000.0*	50000.0*	0	0	6	0.0020	Yes	Yes			
Dibenz(a,h)anthracene	000053-70-3	10000	1.00E+00	1.00E-04	2.00E-05	2.00E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	0	0	...	...	No	Yes	
Dibenzofuran†	000132-64-9	1000	1.00E+00	1.00E-04	2.00E-01	2.00E-05	0.4000	1.0000	500.0	500.0	500.0	500.0	1000	1000	11	0.0200	Yes	Yes			
Dibromo-3-chloropropane, 1,2-†	000096-12-8	10000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	50.0	50.0	50.0	50.0	10	10	11	1.0000	Yes	No			
Dibromoethane, 1,2-†	000106-93-4	1000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	10	100	17	1.0000	Yes	No			
Dichlorobenzene, 1,4-†	000106-46-7	10	1.00E+00	1.00E-02	2.00E-01	2.00E-03	0.4000	0.4000	5000.0	5000.0	5000.0	5000.0	1000	1000	17	1.0000	Yes	No			
Dichloroethane, 1,1-†	000075-34-3	10	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	0	0	17	1.0000	Yes	No			
Dichloroethane, 1,2-†	000107-06-2	1000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	10	100	17	1.0000	Yes	No			

* Indicates difference between previous version of chemical data (JUN 96) and current version of chemical data (JAN04).

** Indicates new hazardous substance in current version of chemical data (JAN04).

† See March 2012 SCDM update for volatile substances.

Hazardous Substance Factor Values

Substance Name	CAS Number	Toxicity	Ground Water Mobility				Bioaccumulation				Ecotoxicity				Air Gas Migration	Air Gas Mobility	Gas Part			
			Liquid		Non-Liquid		Persistence		Food Chain		Environment		Ecotoxicity							
			Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt						
Dichloroethylene, 1,1-†	000075-35-4	10	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	50.0	50.0	50.0	50.0	100	1	17	1.0000	Yes	No		
Dichloroethylene, 1,2-**‡	000540-59-0	100	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	50.0	50.0	50.0	50.0	1	100	17	1.0000	Yes	No		
Dichloroethylene, cis-1,2-†	000156-59-2	1000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	50.0	50.0	50.0	50.0	0	0	17	1.0000	Yes	No		
Dichloroethylene, trans-1,2-†	000156-60-5	100	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	50.0	50.0	50.0	50.0	1	1	17	1.0000	Yes	No		
Dichlorophenol, 2,4-	000120-83-2	1000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.0007	0.0700	50.0	50.0	500.0	500.0	10000*	100	11	0.2000	Yes	Yes		
Dichloropropane, 1,2-†	000078-87-5	1000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	10	10	17	1.0000	Yes	No		
Dichloropropene, 1,3-†	000542-75-6	100	1.00E+00	1.00E-02	1.00E+00	1.00E-02	0.4000	0.4000	50.0	50.0	50.0	50.0	1000	1000	17	1.0000	Yes	No		
Dieldrin	000060-57-1	10000	1.00E+00	1.00E-02	2.00E-03	2.00E-05	1.0000	1.0000	50000.0	50000.0	500000.0	500000.0	500000.0*	10000	10000	6	0.0020	Yes	Yes	
Diethyl phthalate	000084-66-2	1	1.00E+00	1.00E-02*	1.00E+00	1.00E-02*	1.0000	1.0000	500.0	500.0	500.0	500.0	10	100*	11	0.2000	Yes	Yes		
Dimethyl phenol, 2,4-	000105-67-9	100	1.00E+00	1.00E-02*	1.00E+00	1.00E-02*	1.0000	0.4000	500.0	500.0	500.0	500.0	100	1000*	11	0.2000	Yes	Yes		
Dinitrobenzene, 1,3-	000099-65-0	10000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.0000	0.4000*	5.0	5.0	5.0	5.0	100	100	6	0.0200	Yes	Yes		
Dioxin 1,4-**	000290-67-5	10	1.00E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	0	0	...	...	No	Yes
Diphenylhydrazine, 1,2-	000122-66-7	1000	1.00E+00	1.00E-02*	2.00E-01	2.00E-03*	1.0000	1.0000	50.0	50.0	50.0	50.0	1000	1000	6	0.0200	Yes	Yes		
Disulfoton	000298-04-4	10000	1.00E+00	1.00E-04*	2.00E-01	2.00E-05*	1.0000	0.4000	500.0	500.0	50000.0*	50000.0*	10000	10000*	6	0.0200	Yes	Yes		

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† See March 2012 SCDM update for volatile substances.

HAZARD RANKING SYSTEM

31 Mar 2012

Hazardous Substance Factor Values

Substance Name	CAS Number	Toxicity	Ground Water Mobility				Bioaccumulation				Ecotoxicity				Air Gas Migration	Air Gas Mobility	Gas Part			
			Liquid		Non-Liquid		Persistence		Food Chain		Environment		Ecotoxicity							
			Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt						
Endosulfan (I or II)	000115-29-7	100	1.00E+00	1.00E+00	2.00E-03	2.00E-03	1.0000	0.4000	5.0*	5000.0	50000.0	5000.0	10000	10000	11	0.0020	Yes	Yes		
Endosulfan I**	000959-98-8	100	1.00E+00	1.00E+00	2.00E-03	2.00E-03	1.0000	1.0000	500.0	500.0	50000.0	50000.0	10000	10000	11	0.0020	Yes	Yes		
Endosulfan II**	033213-65-9	100	1.00E+00	1.00E+00	...	...	1.0000	1.0000	500.0	500.0	5000.0	5000.0	10000	10000	11	0.0020	Yes	Yes
Endrin	000072-20-8	10000	1.00E+00	1.00E-02	2.00E-03	2.00E-05	1.0000	1.0000	5000.0	5000.0	50000.0	5000.0	10000	10000	6	0.0020	Yes	Yes		
Endrin aldehyde	007421-93-4	0	1.00E+00	1.00E-04*	2.00E-03*	2.00E-07*	1.0000*	1.0000*	5000.0*	5000.0*	5000.0*	5000.0*	0	0	6*	0.0020*	Yes*	Yes		
Ethyl benzene †	000100-41-4	10	1.00E+00	1.00E-02	1.00E+00	1.00E-02	0.4000	0.4000	50.0	50.0	50.0	50.0	100	1000	17	1.0000	Yes	No		
Ethyl chloride	000075-00-3	1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.0007	0.0700	5.0	5.0	5.0	5.0	0	0	17	1.0000	Yes	No		
Ethylene glycol monobutyl ether (EBGE)**	000111-76-2	10	1.00E+00	1.00E+00	...	...	1.0000	1.0000	5.0	5.0	5.0	5.0	1	1	...	...	No	Yes
Fluorene†	000086-73-7	100	1.00E+00	1.00E-04	2.00E-01	2.00E-05	1.0000	1.0000	500.0	500.0	50000.0	50000.0	1000	1000	11	0.0200	Yes	Yes		
Fluorine	007782-41-4	10	1.00E+00	1.00E-02	2.00E-01*	2.00E-03*	0.4000	0.0700	50000.0*	50000.0*	50000.0*	50000.0*	0	0	17	1.0000	Yes	No		
Heptachlor	000076-44-8	1000	1.00E+00	1.00E-04	2.00E-03	2.00E-07	0.4000*	0.4000*	50000.0*	50000.0*	50000.0	50000.0	10000	10000	11	0.0200	Yes	Yes		
Heptachlor epoxide, alpha, beta, gamma	001024-57-3	10000	1.00E+00	1.00E-04*	2.00E-03	2.00E-07*	1.0000	1.0000	5000.0*	5000.0*	50000.0	50000.0	10000	10000	6	0.0200	Yes	Yes		
Heptachlorodibenzo-p-dioxin**	037871-00-4	0	1.00E+00	1.00E-04	2.00E-05	2.00E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	0	0	...	...	No	Yes
Heptachlorodibenzo-p-dioxin 1,2,3,4,6,7,8-	035822-46-9	10000	1.00E+00	1.00E-04	2.00E-05	2.00E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	0	0	No	Yes		

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Hazardous Substance Factor Values

Substance Name	CAS Number	Toxicity	Ground Water Mobility				Bioaccumulation				Ecotoxicity				Air Gas	Air Gas	
			Liquid		Non-Liquid		Persistence		Food Chain		Environment		Fresh		Migration	Mobility	
			Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt	Gas	Part	
Heptachlorodibenzofuran 1,2,3,4,6,7,8-	067562-39-4	10000	1.00E+00	1.00E-04	2.00E-05	2.00E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	0	0	6*	0.0002*	
Heptachlorodibenzofuran 1,2,3,4,7,8,9-	055673-89-7	10000*	1.00E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	0	0	...	...	No Yes
Hexabromobiphenyl (PBB)**	036355-01-8	1	1.00E+00	1.00E-04	2.00E-05	2.00E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	0	0	6	0.0002	Yes Yes
Hexachlorobenzene	000118-74-1	1000	1.00E+00	1.00E-02	2.00E-05	2.00E-07	1.0000	1.0000	50000.0*	50000.0	50000.0	50000.0	10000*	10000	11	0.0200	Yes Yes
Hexachlorobutadiene	000087-68-3	10000	1.00E+00	1.00E-04*	2.00E-01	2.00E-05*	1.0000	1.0000	50.0	50000.0*	5000.0	50000.0*	10000	1000*	17	1.0000	Yes No
Hexachlorocyclohexane, alpha-	000319-84-6	10000	1.00E+00	1.00E+00	2.00E-01	2.00E-01	1.0000	1.0000	5000.0*	50000.0*	5000.0*	50000.0*	1000*	1000	11	0.0200	Yes Yes
Hexachlorocyclohexane, beta-	000319-85-7	100	1.00E+00	1.00E+00	2.00E-03	2.00E-03	1.0000	1.0000	500.0	500.0	5000.0*	5000.0	1000*	1000*	6	0.0020	Yes Yes
Hexachlorodibenzo-p-dioxin 1,2,3,4,7,8-	039227-28-6	10000	1.00E+00	1.00E-04	2.00E-05	2.00E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	0	0	...	...	No Yes
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8-	057653-85-7	10000	1.00E+00	1.00E-04*	...	...	1.0000*	1.0000*	5000.0	5000.0	5000.0	5000.0	0*	0*	...	...	No Yes
Hexachlorodibenzo-p-dioxin 1,2,3,7,8,9-	019408-74-3	10000	1.00E+00	1.00E-04*	2.00E-05*	2.00E-09*	1.0000*	1.0000*	50000.0*	50000.0*	50000.0*	50000.0*	0	0	...	...	No Yes
Hexachlorodibenzofuran 1,2,3,4,7,8-	070648-26-9	10000	1.00E+00	1.00E-04	2.00E-05	2.00E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	0	0	...	...	No Yes
Hexachlorodibenzofuran 1,2,3,6,7,8-	057117-44-9	10000	1.00E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	0	0	...	...	No Yes
Hexachlorodibenzofuran 1,2,3,7,8,9-	072918-21-9	10000	1.00E+00	0.4000	0.0700	0.5	0.5	0.5	0.5	0	0	No Yes

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Hazardous Substance Factor Values

Substance Name	CAS Number	Toxicity	Ground Water Mobility				Bioaccumulation				Ecotoxicity				Air Gas Migration	Air Gas Mobility	Gas Part			
			Liquid		Non-Liquid		Persistence		Food Chain		Environment		Ecotoxicity							
			Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt						
Hexachlorodibenzofuran 2,3,4,6,7,8-	060851-34-5	10000	1.00E+00	...	...	...	0.4000	0.0700	0.5	0.5	0.5	0.5	0	0	...	...	No Yes
Hydrazine	000302-01-2	10000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000*	0.0700*	0.5	0.5	0.5	0.5	10000	100	11*	1.0000	Yes No			
Hydrogen sulfide	007783-06-4	1000*	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.0007*	0.0700	0.5	0.5	0.5	0.5	1000	1000	17	1.0000	Yes No			
Indeno(1,2,3-cd)pyrene	000193-39-5	1000	1.00E+00	1.00E-04	2.00E-05	2.00E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	0	0	...	...	No Yes	
Iron	007439-89-6	1	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	5000.0*	5000.0*	5000.0*	5000.0*	10	10	...	...	No Yes	
Lead	007439-92-1	10000	1.00E+00	1.00E-02	1.00E+00*	1.00E-02*	1.0000	1.0000	5.0*	5000.0	50000.0*	5000.0	1000	1000	...	...	No Yes	
Lead chromate**	007758-97-6	10000	1.00E+00	...	2.00E-03	...	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	0	0	...	...	No Yes	
Lindane	000058-89-9	10000	1.00E+00	1.00E+00	2.00E-01	2.00E-01	1.0000	1.0000	50000.0*	5000.0*	50000.0*	5000.0*	10000	10000	11	0.0200	Yes Yes			
Manganese	007439-96-5	10000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	50000.0*	50000.0*	50000.0	50000.0	0	0	...	...	No Yes	
Mercury†	007439-97-6	10000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	0.4000	1.0000	50000.0	50000.0	50000.0	50000.0	10000	10000	17	0.2000	Yes Yes			
Methoxychlor	000072-43-5	100	1.00E+00	1.00E-04*	2.00E-03	2.00E-07*	1.0000	1.0000	5.0*	50000.0*	50000.0*	50000.0*	10000	10000	6	0.0020	Yes Yes			
Methyl Parathion	000298-00-0	10000	1.00E+00	1.00E-02*	2.00E-01	2.00E-03*	1.0000	0.4000	50.0	50.0	50.0	50.0	10000	10000	6	0.0200	Yes Yes			
Methyl ethyl ketone†	000078-93-3	1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	0.4000	0.5	0.5	0.5	0.5	1	1	17	1.0000	Yes No			
Methyl isobutyl ketone	000108-10-1	10*	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	0.4000	5.0	5.0	5.0	5.0	1	1	17	1.0000	Yes No			

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Hazardous Substance Factor Values

Substance Name	CAS Number	Toxicity	Ground Water Mobility				Persistence	Bioaccumulation				Ecotoxicity				Air Gas Migration	Air Gas Mobility	Gas Part				
			Liquid		Non-Liquid			Food Chain		Environment		Fresh		Salt								
			Karst	Non-Karst	Karst	Non-Karst		River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt							
Methyl phenol, 4-	000106-44-5	100	1.00E+00	1.00E-02*	1.00E+00	1.00E-02*	0.0007*	0.0007*	5.0	5.0	5.0	5.0	100*	100*	11	1.0000	Yes	No				
Methyl tert-butyl ether (MTBE)**†	001634-04-4	10	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	1	1	17	1.0000	Yes	No			
Methylene chloride (dichloromethane)†	000075-09-2	100	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	5.0	5.0	500.0	500.0	1	10	17	1.0000	Yes	No			
Methylnaphthalene, 2-†	000091-57-6	1000	1.00E+00	1.00E-02	2.00E-01	2.00E-03	0.4000	0.4000	50000.0	50000.0	50000.0	50000.0	100	1000	11	0.2000	Yes	Yes				
Naphthalene†	000091-20-3	1000	1.00E+00	1.00E-02	2.00E-01	2.00E-03	0.4000	0.4000	50000.0	5000.0	50000.0	5000.0	1000	1000	11	0.2000	Yes	Yes				
Nickel	007440-02-0	10000	1.00E+00	1.00E-02	1.00E+00*	1.00E-02*	1.0000	1.0000	0.5	500.0	500.0	500.0	100*	1000	...	...	No	Yes		
Nitrosodiphenylamine, N-	000086-30-6	10	1.00E+00	1.00E-02*	2.00E-01	2.00E-03*	1.0000	1.0000	500.0	500.0	500.0	500.0	100	100	6	0.0200	Yes	Yes				
Pentachlorodibenzo-p-dioxin 1,2,3,7,8-	040321-76-4	10000	1.00E+00	1.00E-04	2.00E-05*	2.00E-09*	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	0*	0*	...	...	No	Yes		
Pentachlorodibenzofuran 1,2,3,7,8-	057117-41-6	0*	1.00E+00	1.00E-04	2.00E-05	2.00E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	0	0	...	...	No	Yes		
Pentachlorodibenzofuran 2,3,4,7,8-**	057117-31-4	10000	1.00E+00	1.00E-04	...	...	1.0000	1.0000	0.5	0.5	0.5	0.5	0	0	6	0.0020	Yes	Yes		
Pentachlorophenol (PCP)	000087-86-5	100	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.0000	1.0000	50000.0*	5000.0*	50000.0*	5000.0*	100	1000	6	0.0200	Yes	Yes				
Perchlorate**	014797-73-0	10000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	0.0700	0.5	0.5	0.5	0.5	0	0	...	...	No	Yes		
Phenanthrene	000085-01-8	0	1.00E+00	1.00E-04*	2.00E-01	2.00E-05*	0.4000*	0.4000*	5000.0*	5000.0*	50000.0*	50000.0*	10000*	10000*	11	0.0200	Yes	Yes				
Phenol	000108-95-2	10*	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.0007*	0.0700*	50.0*	5.0	50000.0*	5.0	10000	1000*	11	1.0000	Yes	No				

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Hazardous Substance Factor Values

Substance Name	CAS Number	Toxicity	Ground Water Mobility				Persistence	Bioaccumulation				Ecotoxicity		Air Gas Migration	Air Gas Mobility	Gas Part		
			Liquid		Non-Liquid			Food Chain		Environment		Ecotoxicity						
			Karst	Non-Karst	Karst	Non-Karst		River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt			
Plutonium	007440-07-5	0	1.00E+00	1.00E-04	...	...	1.0000	1.0000	500.0*	500.0*	500.0*	500.0*	0	0	...	...	No Yes
Polychlorinated biphenyls (PCBs)	001336-36-3	10000	1.00E+00	1.00E-04	2.00E-03	2.00E-07	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	10000	10000	11	0.0200	Yes Yes	
Pyrene†	000129-00-0	100	1.00E+00	1.00E-04	2.00E-03	2.00E-07	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	10000	10000	6	0.0020	Yes Yes	
Radium	007440-14-4	0	1.00E+00	1.00E-02	1.00E+00*	1.00E-02*	1.0000	1.0000	0.5*	0.5*	0.5*	0.5*	0	0	...	...	No Yes
Radon	010043-92-2	0	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	0.0700	0.5	0.5	0.5	0.5	0	0	17	1.0000	Yes No	
Selenium	007782-49-2	100	1.00E+00	1.00E+00*	1.00E+00	1.00E+00*	1.0000	1.0000	50.0*	500.0*	500.0*	500.0*	1000	100	...	...	No Yes
Silver	007440-22-4	100	1.00E+00	1.00E+00	1.00E+00*	1.00E+00*	1.0000	1.0000	50.0	50000.0*	50.0	50000.0*	10000	10000	...	...	No Yes
Strontium	007440-24-6	1	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	5.0*	5.0*	5.0*	5.0*	0	0	...	...	No Yes
Styrene†	000100-42-5	10	1.00E+00	1.00E-02	1.00E+00	1.00E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	100	100	17	1.0000	Yes No	
Tetrachlorobenzene, 1,2,4,5-	000095-94-3	10000	1.00E+00	1.00E-02	2.00E-03	2.00E-05	1.0000	1.0000	5000.0	5000.0	5000.0	5000.0	10000*	1000	17	0.2000	Yes Yes	
Tetrachlorodibenzo-p-dioxin**	041903-57-5	0	1.00E+00	1.00E-04	2.00E-05	2.00E-09	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	0	0	...	...	No Yes
Tetrachlorodibenzo-p-dioxin 2,3,7,8-(TCDD)	001746-01-6	10000	1.00E+00	1.00E-04	2.00E-05	2.00E-09	1.0000	1.0000	5000.0	5000.0	5000.0	5000.0	0*	0*	6	0.0002	Yes Yes	
Tetrachlorodibenzofuran 2,3,7,8-	051207-31-9	10000	1.00E+00	1.00E-04	2.00E-05*	2.00E-09*	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	0	0	6*	0.0020*	Yes* Yes	
Tetrachloroethane, 1,1,2,2-†	000079-34-5	100	1.00E+00	1.00E-02	1.00E+00	1.00E-02	0.4000	1.0000	5.0	5.0	5.0	5.0	100	1000	11	1.0000	Yes No	

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Hazardous Substance Factor Values

Substance Name	CAS Number	Toxicity	Ground Water Mobility				Bioaccumulation				Ecotoxicity				Air Gas Migration	Air Gas Mobility	Gas Part			
			Liquid		Non-Liquid		Persistence		Food Chain		Environment		Ecotoxicity							
			Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt						
Tetrachloroethylene†	000127-18-4	100	1.00E+00	1.00E-02	1.00E+00	1.00E-02	0.4000	1.0000	50.0	500.0	50.0	500.0	100	1000	17	1.0000	Yes	No		
Thallium	007440-28-0	100	1.00E+00	1.00E-02*	1.00E+00	1.00E-02*	1.0000	1.0000	500.0	50.0	500.0	50.0	0*	0*	...	...	No	Yes
Toluene†	000108-88-3	10	1.00E+00	1.00E-02	1.00E+00	1.00E-02	0.4000	1.0000	50.0	50.0	5000.0	50.0	100	100	17	1.0000	Yes	No		
Toxaphene	008001-35-2	1000	1.00E+00	1.00E-04*	2.00E-03	2.00E-07*	1.0000	1.0000	50000.0	50000.0	50000.0	50000.0	10000	10000	6	0.0020	Yes	Yes		
Trichlorobenzene, 1,2,4-†	000120-82-1	1000	1.00E+00	1.00E-02	2.00E-01	2.00E-03	0.4000	0.4000	5000.0	500.0	5000.0	500.0	1000	10000	17	1.0000	Yes	No		
Trichloroethane, 1,1,1-†	000071-55-6	1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	10	100	17	1.0000	Yes	No		
Trichloroethane, 1,1,2-†	000079-00-5	10000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	5.0	5.0	5.0	5.0	100	10	17	1.0000	Yes	No		
Trichloroethylene (TCE)	000079-01-6	Refer to Trichloroethylene (TCE) Appendix BI Interim Report																		
Trichlorofluoromethane†	000075-69-4	10	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	1.0000	50.0	50.0	50.0	50.0	0	0	17	1.0000	Yes	No		
Trichlorophenol, 2,4,6-	000088-06-2	10	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.0000	0.4000	5000.0*	5000.0*	50000.0	50000.0	1000	100	11	0.2000	Yes	Yes	
Trichloropropane, 1,2,3-†	000096-18-4	10000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	10	10	11	1.0000	Yes	No		
Trifluralin (Treflan)	001582-09-8	100	1.00E+00	1.00E-02	2.00E-01	2.00E-03	1.0000	1.0000	5000.0	5000.0	50000.0	50000.0	10000	10000*	11	0.0200	Yes	Yes		
Trinitrobenzene, 1,3,5-	000099-35-4	100*	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	0.0700	5.0	5.0	5.0	5.0	1000	1000	0*	0.0020*	Yes	Yes		
Vanadium	007440-62-2	100	1.00E+00	1.00E-02	1.00E+00*	1.00E-02*	1.0000	1.0000	500.0*	500.0*	500.0*	500.0*	0	0	...	...	No	Yes
Vinyl acetate†	000108-05-4	10	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.4000	0.4000	0.5	0.5	0.5	0.5	10	100	17	1.0000	Yes	No		

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† See March 2012 SCDM update for volatile substances.

HAZARD RANKING SYSTEM

31 Mar 2012

Hazardous Substance Factor Values

Substance Name	CAS Number	Toxicity	Ground Water Mobility				Persistence	Bioaccumulation				Ecotoxicity		Air Gas Migration	Air Gas Mobility	Gas Part		
			Liquid		Non-Liquid			Food Chain		Environment		Ecotoxicity						
			Karst	Non-Karst	Karst	Non-Karst		River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt			
Vinyl chloride†	000075-01-4	10000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0.0007	0.0700	5.0	5.0	5.0	5.0	0	0	17	1.0000	Yes	No
Xylene***†	001330-20-7	100	1.00E+00	1.00E-02	1.00E+00	1.00E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	100	100	17	1.0000	Yes	No
Xylene, m-†	000108-38-3	100	1.00E+00	1.00E-02	1.00E+00	1.00E-02	0.4000	1.0000	500.0	500.0	500.0	500.0	100	100	17	1.0000	Yes	No
Xylene, o-†	000095-47-6	100	1.00E+00	1.00E-02	1.00E+00	1.00E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	100	100	17	1.0000	Yes	No
Xylene, p-†	000106-42-3	100	1.00E+00	1.00E-02	1.00E+00	1.00E-02	0.4000	1.0000	50.0	50.0	50.0	50.0	100	100	17	1.0000	Yes	No
Zinc	007440-66-6	10	1.00E+00	1.00E-02	1.00E+00*	1.00E-02*	1.0000	1.0000	5.0*	50000.0	50000.0*	50000.0	10	100	No	Yes

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HAZARD RANKING SYSTEM

31 Mar 2012

Hazardous Substance Factor Values

Substance Name	CAS Number	Toxicity	Ground Water Mobility				Bioaccumulation				Ecotoxicity				Air Migration	Gas Mobility	Air Gas Part			
			Liquid		Non-Liquid		Persistence		Food Chain		Environment		Fresh							
			Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt						
Americium 241	014596-10-2	10000	1.00E+00	1.00E-02	...	...	1.0000	1.0000	0.5	0.5	0.5	0.5	10000	10000	...	...	No Yes
Antimony 125(+D) (radionuclide)	014234-35-6	1000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	5.0*	5.0*	5.0	50.0*	1000	1000	...	...	No Yes	
Cadmium 109 (radionuclide)	014109-32-1	1000	1.00E+00	1.00E-02	1.00E+00*	1.00E-02*	1.0000	1.0000	5000.0	50000.0*	50000.0*	50000.0*	1000	1000	...	...	No Yes	
Cesium 137(+D) (radionuclide)	010045-97-3	10000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	5.0*	50.0*	5.0*	50.0*	10000	10000	...	...	No Yes	
<hr/>																				
Cobalt 57 (radionuclide)	013981-50-5	100	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	5000.0*	5000.0*	5000.0	5000.0	100	100	...	...	No Yes	
Cobalt 60 (radionuclide)	010198-40-0	10000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	5000.0*	5000.0*	5000.0	5000.0	10000	10000	...	...	No Yes	
Iron 55 (radionuclide)	014681-59-5	100	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	5000.0*	5000.0*	5000.0*	5000.0*	100	100	...	...	No Yes	
Lead 210(+D) (radionuclide)	014255-04-0	10000	1.00E+00	1.00E-02	1.00E+00*	1.00E-02*	1.0000	1.0000	5.0*	5000.0	50000.0*	5000.0	10000	10000	...	...	No Yes	
<hr/>																				
Manganese 54 (radionuclide)	013966-31-9	1000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	50000.0*	50000.0*	50000.0	50000.0	1000	1000	...	...	No Yes	
Nickel 59 (radionuclide)	014336-70-0	100	1.00E+00	1.00E-02	1.00E+00*	1.00E-02*	1.0000	1.0000	0.5	500.0	500.0	500.0	100	100	...	...	No Yes	
Nickel 63 (radionuclide)	013981-37-8	100	1.00E+00	1.00E-02	1.00E+00*	1.00E-02*	1.0000	1.0000	0.5	500.0	500.0	500.0	100	100	...	...	No Yes	
Plutonium 236 (radionuclide)	015411-92-4	10000	1.00E+00	1.00E-04	...	...	1.0000	1.0000	500.0*	500.0*	500.0*	500.0*	10000	10000	...	...	No Yes
<hr/>																				
Plutonium 238 (radionuclide)	013981-16-3	10000	1.00E+00	1.00E-04	...	...	1.0000	1.0000	500.0*	500.0*	500.0*	500.0*	10000	10000	...	...	No Yes
Plutonium 239 (radionuclide)	015117-48-3	10000	1.00E+00	1.00E-04	...	...	1.0000	1.0000	500.0*	500.0*	500.0*	500.0*	10000	10000	...	...	No Yes
Plutonium 240 (radionuclide)	014119-33-6	10000	1.00E+00	1.00E-04	1.0000	1.0000	500.0*	500.0*	500.0*	500.0*	10000	10000	No Yes			

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Hazardous Substance Factor Values

Substance Name	CAS Number	Toxicity	Ground Water Mobility				Bioaccumulation				Ecotoxicity				Air Gas Migration	Air Gas Mobility	Gas Part			
			Liquid		Non-Liquid		Persistence		Food Chain		Environment		Fresh							
			Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt						
Plutonium 241(+D) (radionuclide)	014119-32-5	10000	1.00E+00	1.00E-04	...	...	1.0000	1.0000	500.0*	500.0*	500.0*	500.0*	10000	10000	...	...	No Yes
Plutonium 242 (radionuclide)	013982-10-0	10000	1.00E+00	1.00E-04	...	...	1.0000	1.0000	500.0*	500.0*	500.0*	500.0*	10000	10000	...	...	No Yes
Plutonium 243 (radionuclide)	015706-37-3	100	1.00E+00	1.00E-04	...	...	0.0700	0.0700	500.0*	500.0*	500.0*	500.0*	100	100	...	...	No Yes
Plutonium 244(+D) (radionuclide)	014119-34-7	10000	1.00E+00	1.00E-04	...	...	1.0000	1.0000	500.0*	500.0*	500.0*	500.0*	10000	10000	...	...	No Yes
Radium 226(+D) (radionuclide)	013982-63-3	10000	1.00E+00	1.00E-02	1.00E+00*	1.00E-02*	1.0000	1.0000	0.5*	0.5*	0.5*	0.5*	10000	10000	...	...	No Yes	
Radium 228(+D) (radionuclide)	015262-20-1	10000	1.00E+00	1.00E-02	1.00E+00*	1.00E-02*	1.0000	1.0000	0.5*	0.5*	0.5*	0.5*	10000	10000	...	...	No Yes	
Radon 222 (+D)(radionuclide)	014859-67-7	1000	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.0000	0.4000	0.5	0.5	0.5	0.5	1000	1000	17	1.0000	Yes No			
Silver 108m(+D) (radionuclide)	014391-65-2	1000*	1.00E+00	1.00E+00	1.00E+00*	1.00E+00*	1.0000	1.0000	50.0	50000.0*	50.0	50000.0*	1000*	1000*	...	...	No Yes	
Silver 110m (radionuclide)	014391-76-5	1000*	1.00E+00	1.00E+00	1.00E+00*	1.00E+00*	1.0000	1.0000	50.0	50000.0*	50.0	50000.0*	1000*	1000*	...	...	No Yes	
Strontium 90(+D) (radionuclide)	010098-97-2	10000	1.00E+00	1.00E-02	1.00E+00	1.00E-02	1.0000	1.0000	5.0*	5.0*	5.0*	5.0*	10000	10000	...	...	No Yes	
Technetium 99 (radionuclide)**	014133-76-7	1000	1.00E+00	1.00E+00	...	...	1.0000	1.0000	0.5	0.5	0.5	0.5	1000	1000	...	...	No Yes
Thallium 204 (radionuclide)	013968-51-9	1000*	1.00E+00	1.00E-02*	1.00E+00	1.00E-02*	1.0000	1.0000	500.0	50.0	500.0	50.0	1000*	1000*	...	...	No Yes	
Thorium 227 (radionuclide)	015623-47-9	10000	1.00E+00	1.00E-02*	1.00E+00	1.00E-02*	1.0000	0.4000	0.5*	0.5*	0.5*	0.5*	10000	10000	...	...	No Yes	
Thorium 228(+D) (radionuclide)	014274-82-9	10000	1.00E+00	1.00E-02*	1.00E+00	1.00E-02*	1.0000	1.0000	0.5*	0.5*	0.5*	0.5*	10000	10000	No Yes			

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Hazardous Substance Factor Values

Substance Name	CAS Number	Toxicity	Ground Water Mobility				Bioaccumulation				Ecotoxicity				Air Migration	Gas Mobility	Air Gas Part			
			Liquid		Non-Liquid		Persistence		Food Chain		Environment		Fresh							
			Karst	Non-Karst	Karst	Non-Karst	River	Lake	Fresh	Salt	Fresh	Salt	Fresh	Salt						
Thorium 229(+D) (radionuclide)	015594-54-4	10000	1.00E+00	1.00E-02*	1.00E+00	1.00E-02*	1.0000	1.0000	0.5*	0.5*	0.5*	0.5*	10000	10000	...	...	No Yes	
Thorium 230 (radionuclide)	014269-63-7	10000	1.00E+00	1.00E-02*	1.00E+00	1.00E-02*	1.0000	1.0000	0.5*	0.5*	0.5*	0.5*	10000	10000	...	...	No Yes	
Thorium 231 (radionuclide)	014932-40-2	1000*	1.00E+00	1.00E-02*	1.00E+00	1.00E-02*	0.4000	0.0700	0.5*	0.5*	0.5*	0.5*	1000*	1000*	...	...	No Yes	
Thorium 232 (radionuclide)	007440-29-1	10000	1.00E+00	1.00E-02*	1.00E+00	1.00E-02*	1.0000	1.0000	0.5*	0.5*	0.5*	0.5*	10000	10000	...	...	No Yes	
Thorium 234 (radionuclide)	015065-10-8	10000*	1.00E+00	1.00E-02*	1.00E+00	1.00E-02*	1.0000	1.0000	0.5*	0.5*	0.5*	0.5*	10000*	10000*	...	...	No Yes	
Tritium	010028-17-8	100	1.00E+00	1.00E+00	...	...	1.0000	1.0000	0.5	0.5	0.5	0.5	100	100	17	1.0000	Yes No	
Uranium 232 (radionuclide)	014158-29-3	10000	1.00E+00	1.00E+00*	2.00E-01*	2.00E-01*	1.0000	1.0000	0.5*	0.5*	0.5*	0.5*	10000	10000	...	...	No Yes	
Uranium 233 (radionuclide)	013968-55-3	10000	1.00E+00	1.00E+00*	2.00E-01*	2.00E-01*	1.0000	1.0000	0.5*	0.5*	0.5*	0.5*	10000	10000	...	...	No Yes	
Uranium 234 (radionuclide)	013966-29-5	10000	1.00E+00	1.00E+00*	2.00E-01*	2.00E-01*	1.0000	1.0000	0.5*	0.5*	0.5*	0.5*	10000	10000	...	...	No Yes	
Uranium 235(+D) (radionuclide)	015117-96-1	10000	1.00E+00	1.00E+00*	2.00E-01*	2.00E-01*	1.0000	1.0000	0.5*	0.5*	0.5*	0.5*	10000	10000	...	...	No Yes	
Uranium 236(+D) (radionuclide)	013982-70-2	10000	1.00E+00	1.00E+00*	2.00E-01*	2.00E-01*	1.0000	1.0000	0.5*	0.5*	0.5*	0.5*	10000	10000	...	...	No Yes	
Uranium 238(+D) (radionuclide)	007440-61-1	10000	1.00E+00	1.00E+00*	2.00E-01*	2.00E-01*	1.0000	1.0000	5000.0*	5000.0*	5000.0*	5000.0*	10000	10000	...	...	No Yes	
Zinc 65 (radionuclide)	013982-39-3	1000	1.00E+00	1.00E-02	1.00E+00*	1.00E-02*	1.0000	1.0000	5.0*	50000.0	50000.0*	50000.0	1000	1000	No Yes			

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